SPE RESPONSE FOR CERTIFICATE OF CORRECTION

Paper No.: _____

DATE : 11/14/06

TO SPE OF : ART UNIT 2633

09/544,662

SUBJECT : Request for Certificate of Correction on Patent No.: 6922530

A response is requested with respect to the accompanying request for a certificate of correction.

Please complete this form and return with file, within **7** days to:
Palm location **7580, Certificates of Correction Branch – South Tower – 9A22**
If response is for an IFW, **return to employee (named below) via PUBSCofC Team in MADRAS.**
With respect to the change(s) requested, correcting Office and/or Applicant's errors, should the patent read as shown in the certificate of correction (COCIN)? No new matter should be introduced, nor should the scope or meaning of the claims be changed.

Valerie Jackson

Thank You For Your Assistance

Certificates of Correction Branch
Tel. No. 703-308-9390 ext. 114

The request for issuing the above-identified correction(s) is hereby:
Note your decision on the appropriate box.

☒ **Approved**	All changes apply.
☐ **Approved in Part**	Specify below which changes **do not** apply.
☐ **Denied**	State the reasons for denial below.

Comments:

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SPE **Art Unit**

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

Patent No.: 6,922,530 B1
Dated: July 26, 2005
Inventor(s): Kauffeldt, et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 10, Line 35, after "and" insert -- second --.
Column 13, Line 27, after "and" insert -- second --.

Mailing Address of Sender:
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Patent No. 6,922,530 B1

Form PTO-1050

per channel, whereas the system **10** of FIG. **1** uses one regenerator **59** and two transponders **57** and **84** per channel.

The operation of the system **110** shown in FIG. **4** is similar to the operation described above for the system **10** of FIG. **1**. Accordingly, a separate detailed explanation of the operation of the system **110** is believed to be unnecessary. The system **110** would respond to a break at **191** in the transmission line **127** in a manner comparable to that described above for the break **91** in the transmission line **27** of the system **10** of FIG. **1**.

The present invention has a number of technical advantages. One such technical advantage is the provision, at an optical level, of protection capability for optical signals, which facilitates an increase in reliability for optical transmissions. A related technical advantage is that this is provided in the context of an optical add/drop multiplexer.

Yet another technical advantage is that capability is provided for optically switching between working and protected paths on a wavelength-by-wavelength basis, rather than switching an entire WDM signal. This in turn permits a system operator to selectively specify that traffic on certain wavelengths of the protected path is non-preemptable unprotected traffic (NUT), while permitting traffic on other wavelengths of the protection path to be selectively preempted. Still another advantage is that, in one disclosed embodiment, only one regenerator and one transponder are needed for each wavelength or channel in a given optical add/drop multiplexer. Another technical advantage is the provision of an embodiment in which add terminals and drop terminals of a multiplexer are coupled to optical switching units that also implement protection switching, thereby avoiding the need to provide separate optical couplers and optical filters to implement adding and dropping of signals, which in turn reduces the overall hardware in the add/drop multiplexer, and thus its cost.

Although certain selected embodiments have been illustrated and described in detail, it will be recognized that various substitutions and alterations can be made therein without departing from the scope of the present invention. For example, it will be recognized that certain components and configurations of components have been used in the disclosed embodiments in order to realize certain functions, but that other components and/or configurations of components could be used to achieve these same functions. It will also be recognized that direct connections disclosed herein could be altered, such that two disclosed components would be coupled to one another through an intermediate component or components, without being directly connected, while still realizing the present invention. Other substitutions and alterations are also possible without departing from the spirit and scope of the present invention, as defined by the following claims.

What is claimed is:

1. An apparatus, comprising a multiplexing unit which includes:

an optical input terminal to which can be applied an optical input signal that includes a plurality of optical component signals which are different;

an optical output terminal at which said multiplexing unit produces an optical output signal;

a plurality of protection input terminals;

a plurality of protection output terminals;

a demultiplexer having an input coupled to said optical input terminal, and having a plurality of outputs, said demultiplexer being operable to optically isolate the component signals of the input signal, and to optically supply each of the isolated component signals to a respective one of said outputs thereof;

a plurality of switching units each having first and second inputs and first and second outputs, each said switching unit being capable of optically coupling said first output thereof to a selected one of said first and second inputs thereof, and being capable of optically coupling said second output thereof to a selected one of said first and second inputs thereof, wherein said outputs of said demultiplexer are each coupled to said first input of a respective said switching unit, said protection input terminals are each coupled to said second input of a respective said switching unit, and said protection output terminals are each coupled to said second output of a respective said switching unit;

a multiplexer having an output coupled to said optical output terminal, and having a plurality of inputs which are each coupled to said first output of a respective said switching unit, said multiplexer being operable to optically multiplex onto said output respective optical component signals present at each of said inputs thereof;

an optical drop coupler coupled between said optical input terminal and said demultiplexer, said optical drop coupler being operable to forward a first copy of said input signal to said demultiplexer and to drop a second copy of said input signal; and

one or more drop terminals each operable to receive a respective one of said optical component signals included in said second copy of said optical signal dropped by said optical drop coupler.

2. An apparatus according to claim **1**, wherein each said switching unit includes a first optical switch having first and second inputs respectively coupled to said first and second inputs of the switching unit, and having first and second outputs respectively coupled to said first and second outputs of the switching unit.

3. An apparatus according to claim **1**, wherein each said switching unit includes a third output, and is capable of optically coupling said third output to a selected one of said first and second inputs.

4. An apparatus according to claim **3**, wherein each said switching unit includes:

a first optical switch having first and second inputs respectively coupled to said first and second inputs of the switching unit, having a first output coupled to said first output of the switching unit, and having a second output; and

a second optical switch having an input coupled to said second output of said first optical switch, and having first and second outputs which are respectively coupled to said second and third outputs of the switching unit.

5. An apparatus according to claim **1**, wherein said multiplexing unit further includes one or more optical filters each operable to extract from said second copy of said input signal and supply to a respective drop terminal a respective one of said component signals of said second copy of said input signal.

6. An apparatus, comprising a multiplexing unit which includes:

an optical input terminal to which can be applied an optical input signal that includes a plurality of optical component signals which are different;

an optical output terminal at which said multiplexing unit produces an optical output signal;

a plurality of protection input terminals;

a plurality of protection output terminals;

a further terminal;

demultiplexer are each coupled to said first input of a respective said switching unit, said protection input terminals are each coupled to said second input of a respective said switching unit, and said protection output terminals are each coupled to said second output of a respective said switching unit;

a multiplexer having an output coupled to said optical output terminal, and having a plurality of inputs which are each coupled to said first output of a respective said switching unit, said multiplexer being operable to optically multiplex onto said output respective optical component signals present at each of said inputs thereof;

an optical add coupler coupled between said multiplexer and said optical output terminal; and

one or more add terminals each coupled to said optical add coupler;

wherein said optical add coupler is operable to optically combine optical signals from said output of said multiplexer and from said add terminals in order to obtain said optical output signal for said optical output terminal.

9. An apparatus according to claim **8**, wherein each said switching unit includes a first optical switch having first and second inputs respectively coupled to said first and second inputs of the switching unit, and having first and second outputs respectively coupled to said first and outputs of the switching unit.

10. An apparatus according to claim **8**, wherein each said switching unit includes a third output, and is capable of optically coupling said third output to a selected one of said first and second inputs.

11. An apparatus according to claim **10**, wherein each said switching unit includes:

a first optical switch having first and second inputs respectively coupled to said first and second inputs of the switching unit, having a first output coupled to said first output of the switching unit, and having a second output; and

a second optical switch having an input coupled to said second output of said first optical switch, and having first and second outputs which are respectively coupled to said second and third outputs of the switching unit.

12. An apparatus according to claim **8**, wherein said multiplexing unit includes:

an optical drop coupler coupled between said optical input terminal and said demultiplexer, said optical drop coupler being operable to forward a first copy of said input signal to said demultiplexer and to drop a second copy of said input signal; and

one or more drop terminals each operable to receive a respective one of said optical component signals included in said second copy of said optical signal dropped by said optical drop coupler.

13. An apparatus, comprising first and second multiplexing units which each include:

an optical input terminal to which can be applied a respective optical input signal that includes a plurality of optical component signals which are different;

an optical output terminal at which said multiplexing unit produces an optical output signal;

a plurality of protection input terminals;

a plurality of protection output terminals;

a demultiplexer having an input coupled to said optical input terminal, and having a plurality of outputs, said demultiplexer being operable to optically isolate the component signals of the input signal, and to optically supply each of the isolated component signals to a respective one of said outputs thereof;

a plurality of switching units each having first and second inputs and first and second outputs, each said switching unit being capable of optically coupling said first output thereof to a selected one of said first and second inputs thereof, and being capable of optically coupling said second output thereof to a selected one of said first and second inputs thereof, wherein said outputs of said demultiplexer are each coupled to said first input of a respective said switching unit, said protection input terminals are each coupled to said second input of a respective said switching unit, and said protection output terminals are each coupled to said second output of a respective said switching unit;

a multiplexer having an output coupled to said optical output terminal, and having a plurality of inputs which are each coupled to said first output of a respective said switching unit, said multiplexer being operable to optically multiplex onto said output respective optical component signals present at each of said inputs thereof;

an optical add coupler coupled between said multiplexer and said optical output terminal; and

one or more add terminals each coupled to said optical add coupler;

wherein said optical add coupler is operable to optically combine optical signals from said output of said multiplexer and from said add terminals in order to obtain said optical output signal for said optical output terminal;

wherein said protection output terminals of said first multiplexing unit are each coupled to a respective said protection input terminal of said second multiplexing unit, and said protection output terminals of said second multiplexing unit are each coupled to a respective said protection input terminal of said first multiplexing unit.

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